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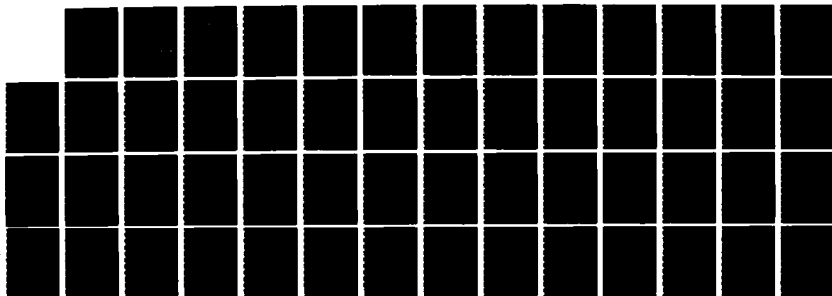
THE RELATIONSHIP OF DEPTH AND AGILITY- HISTORICAL CASES
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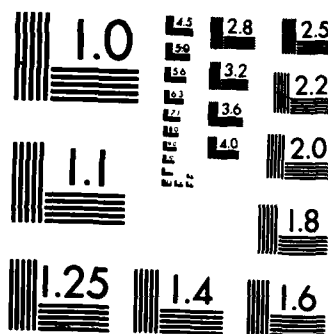
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The Relationship of Depth and Agility: Historical Cases and
Observations Relevant to NATO's Present Dilemma

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by
Major Craig H. Pearson
Aviation

School of Advanced Military Studies
U.S. Army Command and General Staff College
Fort Leavenworth, Kansas

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1. Agility is largely a mindset, as is stated in FM 100-5 and shown in the historical cases studied. Training and war games alone should therefore provide a significant improvement.

2. Gains in depth have been the priority for several years and the easy and inexpensive discoveries have probably already been made.

3. Agility has had little recent emphasis and, therefore, could provide some feasible alternatives very rapidly and inexpensively.

The study concludes that the Warsaw Pact has and will almost certainly retain a significant advantage over NATO in depth. Their centralized control system is, however, inherently less agile than the forces of NATO. NATO should therefore emphasize its potential advantage in relative agility to defeat any aggression by the Warsaw Pact.

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Name of Student: Craig H. Pearson, Major, Aviation

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NATO's Present Dilemma

Approved by:

Kenneth G. Carlson

-----, Monograph Director
LTC Kenneth G. Carlson, M.P.A.

Richard Hart Sinnreich

-----, Director, School of Advanced
COL Richard Hart Sinnreich, M.A. Military Studies

Philip J. Brookes

-----, Director, Graduate Degree
Philip J. Brookes, Ph.D. Programs

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ABSTRACT

The Relationship of Depth and Agility: Historical Cases and Observations Relevant to NATO's Present Dilemma by Major Craig H. Pearson, USA, 48 pages.

This study investigates the relationship between depth and agility using the historical method, identifies principles which govern those relationships, and seeks to apply these principles to NATO's current posture. Historical cases used include the German defenses at Kharkov (I), Kursk (II) and Normandy, the Soviet defense at Kursk (I), the Allied defense in the Ardennes, and the Japanese defense in Manchuria.

The study concludes that the relationship between depth and agility centers on time. The greater the depth the greater the amount of time to respond. It is further evident that, even in cases of greater relative depth, a certain minimum level of agility is required to capitalize on that advantage or it will ultimately be lost. It also follows that a force lacking in relative depth must be more agile in order to respond successfully to potentially decisive breakthroughs. Here, too, there exists a minimum level. When the force reaches a point that, in spite of its agility advantage it can neither hold the shoulders of a penetration nor form a viable operational reserve, it is so lacking in depth that it cannot succeed.

In analyzing NATO's present situation the study finds that, due to political, economic, and technological constraints, NATO has reached a point of diminishing marginal returns in increasing its depth on the battlefield. Although greater depth is desirable, it may not be feasible to achieve it. Increases in agility offer a viable option to this dilemma for the following reasons:

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The Relationship of Depth and Agility: Historical Cases and Observations Relevant to NATO's Present Dilemma

I. Introduction

NATO is firmly committed to the forward defense of all its territory. Only through the stated policy of protection of every inch of its domain does the alliance feel it demonstrates sufficient resolve to pose a credible deterrence to the Warsaw Pact (Pact). Geography and demography also dictate that no terrain can be lost without unacceptably severe consequences. Article V of the NATO Treaty, therefore, states:

The Parties agree that an armed attack against one or more of them in Europe shall be considered an attack against them all and consequently they agree that, if such an attack occurs, each of them...will assist the Party or Parties so attacked...to restore and maintain the security of the North Atlantic area.¹

These are key and central issues to the alliance and cannot be challenged on even the most cogent military considerations.

Inherent in any defense is the requirement for at least a minimal level of depth. Depth is generally understood to mean space in which to engage the enemy without placing at risk any terrain critical to the favorable settlement of the conflict. Field Manual 100-5 expands this definition by asserting that depth is "the extension of operations in space, time, and resources." It goes on to state that "Momentum in the attack and elasticity in the defense derive from depth."² NATO's policy of Forward Defense clearly limits the amount of depth in terms of space available on the friendly side of its borders.

Time is also a serious constraint on NATO. The proximity to the battlefield of the Pact as compared to the United States is an obvious disadvantage to NATO. The commitment of reinforcements and the provision of supplies to forces in the theater is a significant challenge across the Atlantic Ocean. Conversely, the Pact enjoys overland lines of communications (LOCs) which, if not interdicted, will be able to maintain a higher rate of flow to the theater at least in the early days of mobilization and conflict. Since the Pact has a significant numerical advantage overall, there will clearly come a time when NATO could be overwhelmed by sheer mass. Time, therefore, favors the Pact, at least until the economies of the West could

be fully mobilized.

Resources are also limited by the very real economic and political pressures of NATO's free societies. Demography also places severe constraints on increasing force size over time. In Germany, for example, the "declining cohort of draft-age youths is projected to cause a shortage of 104,000 out of 252,000 draftees in the Bundeswehr by 1990."³ It is, therefore, not a viable option to significantly increase the overall size of NATO's forces, particularly its more expensive and manpower-intensive conventional forces. Because of this the Pact has and will most probably continue to maintain or expand a marked numerical superiority in conventional forces. A 1985 comparison of NATO versus Pact forces graphically depicts the disparity as follows:

Total Uniformed Manpower - 5.0:6.1

Main Battle Tanks - 2:5

Antitank Guided Weapon Launchers - 1:2

Artillery and Mortars - 1:2

Attack Helicopters - 1:3⁴

Many feel that this is an overly optimistic appraisal of NATO's forces relative to the Pact. Nonetheless, it is clear that NATO is, and probably will remain, at a relative numerical disadvantage to its primary adversary.

NATO is painfully aware that depth in all its facets favors the Pact. To correct this situation, NATO has initiated many programs to gain depth on the enemy side of the FLOT through the use of what has been termed the deep strike concept. Included in this concept are significant programmatic and doctrinal changes such as the Emerging Technologies Initiatives, Follow-on Forces Attack (FOFA), and Counter-Air 90. The crux of most of these programs is to optimize the technological advantages of NATO to attack the larger Pact forces in depth on his side of the FLOT. The American Defense Annual 1985-1986 states, however, that:

Concepts such as FOFA seek to extend the range of interdiction operations deep in the enemy's rear by application of new technologies that can see and then shoot at ground targets with great accuracy. The technological challenge and organizational complexity of operations over such an expanse of terrain have contributed to criticism of the deep strike concepts.⁵

Analyst Steven Canby, writing about deep strike technologies has also recently addressed what he terms as

...serious issues of cost and operational effectiveness--that it (high-tech deep attack weaponry) may cost an order of magnitude more than estimated by advocates and still not work or be easily overcome by cheap Soviet countermeasures."⁶

So, although some progress has been made, it has been expensive and has perhaps reached the point where the returns are marginal at best and may not be affordable. This is aggravated by the lack of funds for the military in most countries where real growth in defense spending has been decidedly less than the 3% promised in 1977. Since 1980, only the U.S., Canada and Luxembourg have consistently made this goal.⁷ In the United States, the recent passage of the Gramm-Rudman Bill has placed serious constraints on many programs, including those in the Department of Defense. It is clear, therefore, that NATO has likely extended its depth to the point of diminishing marginal returns and, in these times of serious economic pressures, must consider other options for defeating any aggression by the Pact.

Historical examples appear to indicate that a relationship exists between depth and agility which may offer an acceptable alternative through increased emphasis on agility. Agility is defined by FM 100-5 as:

...the ability of friendly forces to act faster than the enemy...Such greater quickness permits the rapid concentration of friendly strengths against enemy vulnerabilities...It is this process of successive concentration against locally weaker or unprepared enemy forces which enables smaller forces to disorient, fragment, and eventually defeat much larger opposing forces.⁸

The case of a smaller force defeating a larger force is obviously relevant to NATO. The concept of agility becomes even more cogent when the last paragraph of the FM 100-5 discussion of agility is considered. It states that "In the end, agility is as much a mental as a physical quality."⁹ It may be reasonable to increase the probability of success against the numerically superior forces of the Pact by the relatively cheap method of emphasizing agility in all future

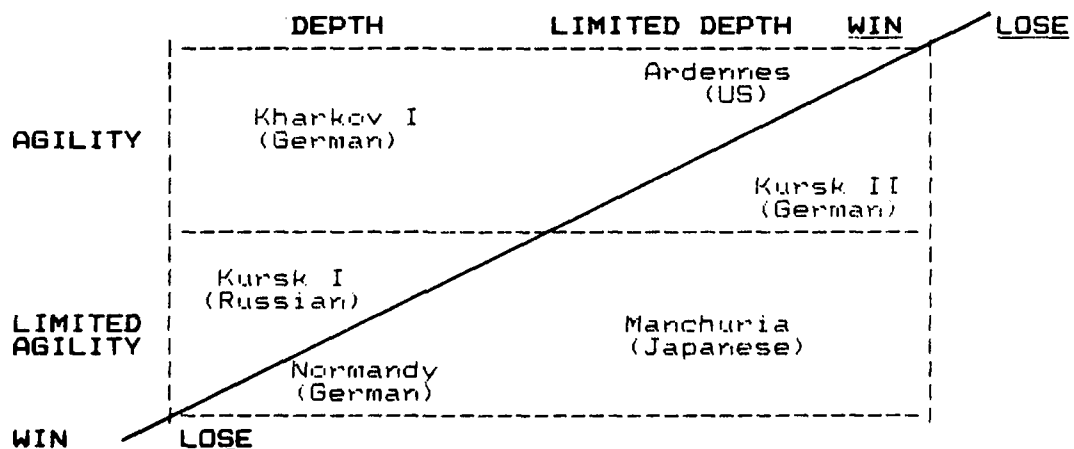
training and doctrine, following that up as necessary with the hardware to further support the concept.

SCOPE

This monograph addresses the conceptual relationship between depth and agility and attempts to apply its findings to NATO's current situation. The perspective is primarily that of a force on the operational defensive as NATO will be in the opening days of a conflict in Europe. The working hypothesis is that all foreseeable substantive and affordable gains in depth that can be made by NATO within its economical, political, and technological constraints have been either completed or, at least, initiated. NATO has therefore reached a point of diminishing marginal returns in pursuit of additional depth. Future emphasis should turn towards agility, where unplowed ground may produce substantial results far more economically.

METHODOLOGY

This monograph uses a historical method to analyze and compare the major operations and campaigns listed below to determine the relationship between depth and agility. To adequately analyze this relationship the following matrix of possibilities will be studied using the indicated cases as examples of each condition.



A complete and detailed analysis of each major operation or campaign is not possible within the confines of this

monograph. It is, therefore, assumed that the reader is reasonably conversant with each of the cases being addressed or will refer to the endnotes or bibliography for sources of additional information.

For the purposes of the analysis, depth will be discussed in terms of space, time, and resources; agility, in terms of mobility, command, control, communications and intelligence (C3I), and mindset.

II. Analysis

Depth and Agility - Successful

Kharkov I (German Perspective)

General Situation: On 19 November 1942 the Russian forces around Stalingrad launched a massive counteroffensive which succeeded in encircling the German Sixth Army. For the next two months the Russian forces continued their advances from the Volga to the Donets. On 19 January 1942, General Vatutin, Commander of the Russian Southwest Front, proposed to Stavka (Russian High Command) that an operation of considerable size be launched to the southwest designed to drive deep into the rear of Army Group "Don" and cut off German withdrawal routes from the Donbas. The ultimate intent of this operation was to cause the collapse of all German forces in the south. The success of the Stalingrad operation had greatly increased Russian confidence in their ability to execute such a massive operation and had convinced them that the Germans were disintegrating. Stavka therefore expanded the plan to include participation by both Fronts on the flanks of Vatutin, the Voronezh and South Fronts. It was a hastily planned operation with the first units initiating the attack on 29 January. The general conduct of the operation is depicted on Map 1.¹⁰

Initially, success was achieved all along the line. As the Soviet penetration developed, the Germans were able to hold both the north and south shoulder. Although a gap of over 200 miles had been torn in the German lines, the shoulders had finally been held. Manstein recognized the danger not only to his Army Group "Don", but to the whole German effort in Southern Russia. Utilizing forces currently assigned to him, as well as several SS panzer units which were fortuitously arriving in the sector, he conducted converging coordinated counterattacks against what he had correctly determined to be the Russian center of gravity, the tank corps of Mobile Group Popov and the Third Tank Army. These attacks were conducted in sequence against the forces which had, as in the case of Mobile Group Popov, stretched their lines of communication (LOCs) up to 400 miles. As the Russian units penetrated, they had dispersed, diluting their combat power to the point that the

smaller but more agile forces of Manstein could attack them at points of relative German strength. Thus, by taking advantage of the "spreading torrent" effect and the reverse synergism it includes, Manstein operationally defeated a significantly larger force in a series of tactical engagements in which he was able to enjoy local superiority in combat power. The separate operations were sequenced to deal first with the most dangerous force, Mobile Group Popov, and subsequently with the larger Third Tank Army which had been delayed by the fighting in Kharkov. As the counterattacks progressed, the separate German units converged on each other, destroying Russian forces as they went. By so doing they created a large gap in the Russian lines which was subsequently exploited by the then massed German forces.

Depth - Space: The area of operations was approximately 750 miles long and 400 miles deep.¹¹ German units were deployed along lightly fortified lines with understrength divisions covering up to 30 kilometers.¹² Central to Manstein's ability to conduct a highly mobile defense was his capability to trade this space for time, and with that time, to gain and position critical resources. During the conduct of the campaign, more than 400 miles of Russian territory were lost, only to be regained during the subsequent German counter offensive. For some period during the early stages of the Russian offensive Manstein had no forces in front of the attacking Russian tank corps. Because of the tremendous defensive space available to him, he was able to allow this to continue long enough to form sufficient mobile reserves to counterattack the flanks of the Soviet forces and defeat them in detail, while taking care not to lose the decisive terrain of the Dneiper River crossings. The Russians were not able to repeat the encirclement as they had at Stalingrad. This was a case when the vastness of the Russian terrain worked to the disadvantage of the Soviet Army.

Time: This was one of the last cases in the war on the Eastern Front when time, at least in the short term perspective, was on the side of the Germans. As time went on the Russians were growing weaker. With no reserves to call upon and LOCs, stretched beyond their limit, still extending, the Russians had clearly exceeded their culminating point.

Conversely, the Germans were growing relatively stronger over time with the arrival of reserve panzer units and the shortening of their LOCs as they withdrew. Time clearly favored the Germans.

Resources: German forces in the sector included Manstein's Army Group "Don" and Kleist's Army Group "A". Force ratios in the area of the main effort were as follows:

Germans	Soviet
<u>Southwest Front</u>	
160,000 troops and 150 tanks	vs 325,000 troops and 500 tanks
<u>Voronezh Front</u>	
50,000 troops and 50 tanks	vs 200,000 troops and 300 tanks ¹³

As is evident, the overall ratio of combat power clearly supported the Russians, but over time the trend was in the Germans favor. Therefore as the Russians grew weaker and more dispersed (reverse synergism) the Germans were increasing in both strength and mass. As the Russians LOCs stretched and were affected by distance or enemy action, the German LOCs contracted, becoming shorter and more efficient.

Agility - Mobility: Relative mobility clearly favored the Germans. Both in equipment and in organization, the Germans were a significantly more mobile force. They had a much higher density of panzer and panzergrenadier units than did the Russians and were far less dependent on horses for logistical transport.

C3I: The German system of command and control was a proven one, refined in the previous years of successful mobile warfare. It had a demonstrated ability to deal with the vast distances and remarkable pace of mechanized operations. Conversely, the Russian system was still developing and, although vastly improved since the beginning of the war, it had not yet caught up to that of its adversary.

Mindset: Here, too, the Germans had the edge due to past experience. Stalingrad had given the Russians a dramatic boost in confidence and the courage of the individual Russian soldier had never been questioned. To compensate for their lack of C3I

and training (in part due to their political system), the Russians had a rigid command system which did not allow for individual initiative or flexibility. The mindset of the Russians was, therefore, to take advantage of the perceived German weaknesses and repeat Stalingrad on a larger scale by a headlong rush to the Dneiper. This mindset was so strong that it caused the Soviet commanders at all levels to disregard the obvious indications of an impending German counterattack and push on with the original plan. The Germans, however, had inbred the concepts of initiative and flexibility into their forces and were therefore able to react much more effectively to the initial Russian successes, ultimately turning them to their advantage.

Summary: The success of the German mobile defense was directly facilitated by its greater relative depth in terms of space, time and resources and its significant agility differential. By trading space for time in which to form a mobile reserve, Manstein took advantage of the Russian expanding torrent and the reverse synergism inherent in it to attack the Russian flanks and defeat the larger Russian forces in detail and sequence. Had the German Forces not been able to hold the shoulders of the penetration, even though the gap was some 200 miles wide, no assailable flanks would have been formed and the result could have been success for the Russian intent.

Conclusions: As demonstrated at Kharkov, a force which possesses superiority in relative depth and agility is capable of conducting successful defensive operations. The conduct of a successful mobile defense will, by the destruction of enemy units and the subsequent gaps created in the enemy front, provide opportunities for offensive actions. The conduct of a mobile defense by a force of inferior size is dependent on the creation of a situation of relative superiority at critical points. Holding the shoulders of a penetration, even if the gap is quite large, will provide the opportunity of an exposed enemy flank and possibly cause the enemy to experience the "expanding torrent syndrome".

**Limited Depth and Limited Agility - Unsuccessful
Manchuria (Japanese Perspective)**

General Situation: The Soviet invasion of Manchuria (Map 2¹⁴) represented the culmination of the Soviet operational art in World War II. It was a massive, multi-directional strike designed to insure a rapid and complete victory by the Soviet forces. To execute the attack and to insure a swift and certain victory, the Soviets doubled the Far East Command to a total of over eighty divisions. Based on lessons learned earlier in the war and to insure adequate control of the massive number of forces spread over such large distances, a full-fledged theater of military operations (TVD) commanded by Marshall A. M. Vasilevsky was formed to oversee the operation.¹⁵

In many ways the Soviet operation was not necessary to the defeat of the Japanese, but because it had been agreed to at Yalta and in order to give Russia a stronger claim to the territory, it was vigorously and masterfully executed at the relatively small cost of 32,000 Russian casualties.¹⁶

Depth - Space: The Manchurian Province was 1.5 million square kilometers of largely unsettled mountains and plateaus. The terrain formed concentric rings with mountains on the exterior guarding the central plain. Primary passes through the mountains usually contained only railroads and trails. Numerous secondary routes, thought by the Japanese to be too constricted and rough for mechanized traffic, also existed. This vast landscape provided great quantities of room in which to defend, with the mountains offering excellent defensible terrain. The overall picture was one of advantage to the defender. The Japanese could use interior lines of the Central Plain and the outer barriers of the mountains of the perimeter to hold off the mechanized forces of the Soviets. This could have apparently offered the type of positional defense, at least in the mountains, at which the Japanese had excelled in the Pacific Islands. Furthermore, the Soviets were stretched to the limits with their lines of communications running all the way across Siberia. Space clearly favored the defender.

Time: Time, however, favored the Soviets. With every passing day their forces increased. Supplies arrived in an efficient and timely manner. Soviet planning and preparation had not only overcome the vast distances, but had done so in much less time than the Japanese thought possible. By the end

of July 1945, the Soviets were ready to attack. The Japanese did not expect them for at least another month. Gaining strategic, operational, and tactical surprise, the Soviets attacked through unexpected terrain, gained an advantage over the Japanese, and overran Manchuria in less than two weeks. Time clearly favored the Soviets, both in terms of force buildup and tempo of the attack.

Resources: The discrepancy here is not as numerically great as might be expected. Japanese forces in the area numbered one million men. In Manchuria alone the Japanese had 713,724 men. The overall ratio of Soviet to Japanese combat forces was 2.2:1 in men, 4.8:1 in tanks and artillery, and 2:1 in aviation assets.¹⁷ Because the Japanese were on the defense and the Soviets were such a long way from their supplies, these ratios, with the possible exception of tanks and artillery, were not unacceptable to the Japanese. It is relevant to note that they compare rather favorably to similar ratios of the Warsaw Pact and NATO today. The ratios belie the critical fact the Japanese were so lacking in mobility and antitank capability that they could not take advantage of their superior depth in terms of space and were, therefore, very quickly overrun. According to Glantz,

"Antitank weapons were lacking, and although the division was heavy in manpower, it was lighter in firepower than its Soviet equivalent. In mechanized and tank forces, the Japanese also compared badly: they had no tank comparable to the Soviet medium T-34. The Kwantung Army was scarcely better equipped to fight in 1945 than it had been in 1939."¹⁸

Furthermore, the Kwangtung Army of 1945 was not the high quality, well trained force it had been in 1939. Its experienced and battle-hardened soldiers had long ago been taken to fill the other combat units in the more active theaters. It was, therefore, neither well trained, highly motivated nor well equipped.

Agility - Mobility: This was clearly the overriding factor in favor of the Soviets. The Japanese formations were not equipped to conduct maneuver warfare at any pace above a walk. As they had proven earlier in the war, they were capable of utilizing maneuver over the roughest terrain to gain an advantage, but here their enemy turned the tables on them at

the speed of a mechanized force - the Japanese never caught up. The Soviets, capitalizing on the mobility of their tracked vehicles, utilized secondary passes through the mountains to bypass many Japanese positions and to outflank others. Furthermore, they used forward detachments from each first echelon division to drive ahead of the retreating Japanese and capture the critical terrain and subsequent defensive positions to prevent their occupation. Given the differential level of mobility enjoyed by the Soviets, the Japanese never caught up with the battle. In places where the Soviets forced them to fight, the Japanese soldiers fought as tenaciously as anywhere in the Pacific Theater. But operationally, the Japanese were never in the campaign due to their poor initial positioning and their lack of mobility.

C3I: Here, too, the Japanese were lacking. Japanese intelligence failed to alert the high command of the impending attack. The offensive was not expected for at least another month and probably not until the spring of 1946. The Japanese were so sure of this that General Yamado, commander of the Kwangtung Army and many of the commanders of the Japanese Fifth Army, were away from their posts on the night of the attacks. The newest Japanese defense plan had not been fully implemented, with many of the units not yet deployed to their new defensive positions due to a lack of transportation and no sense of urgency on the part of the high command.

The Japanese high command bore much of the blame for the poor showing of their forces. Glantz writes,

Setting aside Soviet actions, the Japanese High Command reacted sloppily and indecisively, whether because of overconfidence, complacency, confusion, or pessimism....For whatever reason, Japanese commanders failed their army. Confusion reigned at the top, and area army and army orders conflicted. Thus, many units withdrew from combat, while others were swallowed up by it.¹²

Mindset: The Japanese mindset has been adequately described above. The effects of the heavy bombing (to include the dropping of the atomic bomb), the concern of the Japanese for their families in the rear, and the thoughts and rumors of an impending cease fire, must have had a numbing effect, particularly on the officers who knew what was occurring in

Japan. Conversely, the Soviet mindset was one of confidence and success. Their mobile warfare concept and operational art had fully matured. These factors, coupled with their sheer preponderance of force in the theater, spelled certain victory for the Russians.

Summary: The Japanese Army was clearly outclassed and over-matched in the Manchurian Campaign. Although the Japanese had tremendous space in which to engage the Soviet Armies, their resources in mobility and tank-killing systems were grossly lacking. The Soviets, aware of this, accurately determined that a campaign of rapid pace which attacked from different directions and converged on the Central Plain would be successful. They were also able to utilize terrain which the Japanese had determined was not trafficable and had therefore not defended. Having gained the freedom of maneuver they needed, the Soviets employed forward detachments to maintain a tempo of operations which the Japanese could not match.

Conclusions: As seen in the 1945 Manchuria case, space alone does not equate to depth. In order to take advantage of space, a force must have sufficient relative mobility to move at some rate in excess of that of its enemy. In a case such as this one where a defensive force has neither an advantage in depth or agility, it has little or no hope of defeating the enemy force. The only hope of delaying the more agile force is to defend superior terrain through strongpoints, realizing that once forces are bypassed they can only serve as stay-behind forces.

Depth and Insufficient Agility - Unsuccessful Normandy (German Perspective)

General Situation: On 6 June 1944, the Allied forces under the command of General Dwight David Eisenhower battled their way ashore on the Normandy Beaches. These landings, code-named Operation OVERLORD, consisted of a airdrop of two airborne divisions behind the beachheads, followed by an amphibious assault by five divisions. As a prelude to the operation, the combined air forces of the Allies had conducted a heavy bombing campaign designed to limit the mobility of the German reserves,

while also supporting the deception plan that the landing was to be made in Pas de Calais.

In attempting to repel these landings, German forces were arrayed from the vicinity of Amsterdam to the South of France. Map 3 depicts the German dispositions in Normandy on the day of the invasion.²⁰ Mobile reserves were retained in depth to be committed before the beachhead became too well formed and solidified. The preponderance of the German forces were retained in the Pas de Calais region, where Hitler was convinced the assault would come. These forces were not all introduced into the battle until up to two weeks after the landings.

Depth - Space: Inadequate space was not a problem for the Germans. If space was a factor, it was an excess of it to defend against the Allied assault.

Time: In any amphibious assault, time favors the defender, at least initially. The attacker must bring everything ashore in a cumbersome manner which may be interdicted by either the enemy or the weather. Conversely, the defender has all his forces on shore, is familiar with the terrain and, unless heavily interdicted from the air or by partisans, has the opportunity to mass his forces against the landing before it is solidified. Until the rate of buildup by the assaulting force exceeds the capability of the defender to mass, time favors the defender.

Resources: Total resources were not a problem for the Germans in France at the time of the landings. By the beginning of May, OKW had at its disposal 1,608 tanks and assault guns. Of this total, 674 were Pzkw IV's and 514 were Panthers. If a significant portion of this force could have been brought to bear against the inherently slow buildup of the assault from the sea, the results could have been devastating.²¹

Agility - Mobility: The structure and capability of the German divisions were similar to the American divisions except in mobility and firepower. Few, if any, of the German units had comparable mobility throughout the unit; i.e., the logistical tail of an armor force was horse-drawn. Conversely, the additional automatic weapons in a German division gave it a

relative firepower advantage even though it had 1,200 fewer soldiers. The 130th Panzer Lehr Division was the only unit in which all panzer grenadier battalions and its engineer battalion were mounted in half-tracks and its artillery was self-propelled, giving it equivalent mobility to its American counterpart.²² The Germans were still, however, extremely effective, having proven their ability to move rapidly on many occasions during the preceding few years.

C3I: The German command structure was chaotic. As commander of OB West, Rundstedt did not have complete control either of Rommel, who was commanding Army Group B, or of the Navy and Air Force support in his area. Furthermore, the two generals were in total disagreement as to how the defense should be conducted. Rundstedt wanted to utilize a heavy mobile striking force, marshalled well away from the coast, to drive the Allies back into the sea. Rommel, having experienced the difficulties of attempting to move without air superiority, favored the positioning of the mobile reserves immediately behind the beaches (Map 4²³). Although Hitler favored Rommel's plan, he never clearly stated his preference but did retain final authority over release of the reserves.²⁴ In fact, at the time of the invasion Rommel was in Germany trying to persuade Hitler to move the panzer divisions forward to meet the anticipated attack.²⁵

Command and control of the units of the German Army was further complicated by the lack of standardization among the units as well as the different chains of command. Six Wehrmacht infantry, three panzer, and at least three parachute divisions, some of which were SS, were positioned in France at the time of the invasion. (This obviously does not include the static garrison divisions of the coastal defense depicted on Map 4.) The SS and the Luftwaffe units (airborne divisions) were not governed by the Wehrmacht as the principal military organization, but by the "semiautonomous satraps of Reichsfuhrer SS Heinrich Himmler and Reichsmarshal Hermann Goering, respectively."²⁶

Mindset: The German Army was the personification of mobile warfare and the inherent agility it required. Concepts like "Auftragstaktik" (mission tactics), "Beweglichkeit"

(flexibility, mental agility, ability to improvise), and "Schwerpunkt" (thrust point, may change during a battle) indicate clearly that the German forces, if permitted by the situation and so directed by their chain of command, would be capable of exercising extreme agility.

Summary: The lack of a timely response by the Germans to the invasion resulted in the landings achieving sufficient strength to gain the operational initiative. The advantages of depth in terms of resources, space and time were negated by the lack of agility on the part of the German forces. This was caused only in part by the heavy bombardments by the Allied Air Forces. The predominate cause was the abysmal command and control relationships established by the Germans. The agility of the "blitzkrieg" was lost due to the indecision and ineptitude of Hitler's ad hoc, imprecise command relationships. Either Rundstedt's or Rommel's concepts may have been successful; as it was, neither was given a chance, much to the good fortune of the Allies.

Conclusions: As seen at Normandy, a relative advantage in depth is totally useless if the force which has it does not or cannot exercise sufficient agility to capitalize on its depth.

Depth and Limited Agility - Successful Kursk I, (Russian Perspective)

General Situation: Following the defeat of the Russian counteroffensive around Kharkov, Manstein launched a highly successful counteroffensive which succeeded in reaching the lines depicted on Map 5 prior to the spring thaw.²⁷ From this point a continuation of the offensive, Operation ZITADELLE, was planned to take advantage of the Soviet weaknesses resulting from the winter losses. Even with the losses of the winter, the Russians remained numerically superior, but the Germans believed themselves to still be vastly superior qualitatively and in the operational art. Later results proved that assumption to be invalid.

The initial date for Operation ZITADELLE was late March 1943, thus providing a short pause for the weary German troops yet not giving the Russians sufficient time to refit and regroup. Dates for ZITADELLE were however repeatedly delayed

by weather and to take advantage of the opportunity to employ the new Panther and Tiger tanks and the Ferdinand assault gun in large quantities. Operations PANTHER and HABICHT were to have proceeded ZITADELLE but were ultimately cancelled. On 18 June, Hitler belatedly set the final date for 5 July.²⁸ What the Germans, particularly Hitler, failed to realize was that their delays favored the Soviets far more than they favored the Germans. The Soviets were out-producing the Germans by a wide margin and, by the end of May, the strategic balance in theater had shifted to the Russians.²⁹ The three month delay had completely changed the situation, but the German plan was the same. Depth was now clearly in the favor of the Russians.

The Russian plan was basically a simple one designed to avoid the loss of control experienced in the winter campaign, while capitalizing on their superior resources and the advantages of the defender. The plan consisted of two stages; the first, an operational defense in the Kursk Salient, was designed to do "something they had never before achieved - namely, stop a German strategic offensive before it had achieved tactical or operational success."³⁰ The second stage was an operational offensive intended to take advantage of the losses inflicted on the Germans during the Soviet defensive.

In the final analysis, the Russian plan worked to perfection. The massive defenses in depth, coupled with Soviet air interdiction and massed artillery, severely sapped the strength of the German attackers, stopping the offensive before it had gained any of its operational objectives.

Depth - Space: The Russian use of space or terrain in and around the Kursk Salient was clearly not in the form of a mobile defense. The defense was organized as depicted on Map 5 with the Central Front in the north and the Voronezh Front in the south.³¹ The density and depth of the defense exceeded anything organized previously in the war. Ziemke describes the defensive organization as follows:

Both fronts had concentrated about one-third of their artillery and tanks in the sector where the German attacks were expected. In the main line of resistance, 2 to 3 miles deep, the armies had dug 3 to 5 trench lines and built weapons emplacements and dugouts. At the depth of 6 and 18 miles, they had constructed similar secondary lines. Behind those, the first about 25 miles back, lay

another three lines that constituted the front defense zone. The Central Front alone, using troops and local civilians, had dug over 3,000 miles of trenches. Every village and every hill in the steppe had been fortified, and in the fields, that summer mostly overgrown with grass, the engineers had set 400,000 mines. Across the eastern end of the bulge, General Armi Ivan S. Konev's Steppe Front had established three armies in a screening line to prevent the Germans from carrying the offensive east if the Soviet defense in the Bulge failed. As additional insurance, an army and two tank armies were held in reserve northeast of Orel and an army and a tank army stood by east of Kharkov-Belgorod. The representatives of the Supreme Command were Vasilevskiy and Zhukov, the proved Stalingrad offensive team.³²

Clearly, the Russians had no intention of utilizing space other than to position overwhelming forces in depth on heavily reinforced terrain across which they expected the Germans to attack.

Time: The respite of over three months provided by the Germans had been used wisely and well as the defensive dispositions indicate. It had provided sufficient time for the preparations which were completed prior to the attack.

During the battle, the Russians also had enough time to successfully react to the German threats, preventing them from becoming decisive penetrations. This time to react resulted largely from the reduction in tempo of the German attack wrought by the Russian defenses. An example of this was the commitment of the Fifth Guards Tank Army against the SS Panzer Corps around Prokhorovka on 12 July 1943. In past engagements the rate of German movement had exceeded the Russian's ability to respond, but at Prokhorovka an entire Soviet tank army met the main effort.

Resources: The balance of forces in the theater was as follows:

	German and Axis	Soviet
Troops	5,325,000	6,442,000
Guns/mortars	56,250	103,085
Tanks/SP's	5,850	9,918
Aircraft	2,980	8,357

Within the salient alone the Russians positioned over 1.3 million men, 20,000 guns and mortars, and 3,500 tanks and self

propelled guns (SPs).³³ Operationally, the Soviets positioned two fronts in the salient and another entire front in reserve (see Map 6).³⁴ Sheer mass of forces provided insurmountable depth into which the Germans obligingly attacked. The disparity of forces was further aggravated for the Germans by the poor showing made by the new tanks and SPs on which the attack had so long waited. Clearly, the Soviets had a significant advantage in depth of resources.

Agility - Mobility: Although some improvements had been made in the Russian forces, the Germans still had a mobility advantage. The majority of the Russian forces remained foot-mobile; logistics were still horse-drawn. Although the trend was clearly toward more mobility for the Russians, the Germans retained the advantage at this stage of the war.

C3I: Russian command and control and intelligence had broken down badly during the previous campaign in and around Kharkov. The C3I was sufficient to conduct a largely positional defense but perhaps not a large-scale offensive. This was one consideration in Zhukov's recommendation to Stalin that a defensive be the first stage in the Soviet strategy. Operational coordination was conducted by the Stavka representatives Zhukov and Vasilevskiy.

Mindset: The Russian mindset below Stavka was oriented on positional defense, at least in the initial stage of the battle. Units would die in place rather than allow the Germans another breakthrough. Operationally, the Russians saw the necessity to go over immediately to the offensive in order to take advantage of the German losses and disorganization and to prevent the massing of forces from other points in the sector at the decisive point.

Summary: By accurately identifying the point at which the main German effort would be made, and having sufficient time to reinforce the terrain and generate forces, the Soviets were able to achieve a resounding victory which may have been the turning-point of the war.

Conclusions: As the Kursk example demonstrates, a force which has overwhelming depth and which can force the enemy to attack into that strength as opposed to bypassing it, can be victorious even though it may be relatively deficient in

agility. The amount of agility required to defeat the attacker is related to the depth or density of the defense. If the defense slows the tempo of the attack to the point that a force which is normally much less agile can react in time to defeat a threat to the continuity of the defense, then it has sufficient agility. It is therefore evident that, even in this case of great depth, a certain minimum level of agility is required to prevent the enemy from massing the majority of his combat power against a small portion of the defense while disregarding the remainder.

This case of overwhelming superiority of depth is not anticipated for the U.S. and NATO in most plausible scenarios.

Insufficient Depth and Sufficient Agility - Unsuccessful

Kursk II, Russian Counteroffensive (German Perspective)

General Situation: As was previously discussed, the Soviet plan for the defense of Kursk consisted of two stages. The first stage was the successful defeat of the German attack into the salient. Once the attack stalled, two counterstrokes were to be initiated. The first, Operation KUTUZOV, was to be conducted against the Orel salient to the north of Kursk by the Western and the Bryansk Fronts (Map 7).³⁵ It was designed to begin even before the Germans realized defeat, thereby threatening the forces in the north and causing the reduction of pressure into the Kursk salient. It began on 12 July, the same day that Hitler called off Operation ZITADELLE, and experienced significant initial success. Strategic linkage also assisted the Russian plans as the Allied landing in Sicily caused Hitler to pull out forces to send to that theater.

On 17 July, the South and the Southwest Fronts launched offensives against the German Army Group South. This served to further dissipate the German forces around Kursk. The Steppe and Voronezh Fronts simultaneously conducted attacks in their sectors, regaining their original defensive lines in a week. The stage was now set for Operation RUMYANTSEV.

Operation RUMYANTSEV (Map 7) was a counteroffensive to the southwest by the Voronezh and Steppe Fronts.³⁶ It was designed to slice through the German Fourth Panzer Army and Army Detachment Kempf by massing large armor forces on a small front

against dissipated German forces with an inadequate mobile reserve. Its goal was to capture the elusive crossings over the Dnieper and thereby trap, or at least force out of southern Russia, Army Group South. On 3 August 1943, having spent less than two weeks to rest and refit, the Russian counteroffensive began in earnest.

Depth - Space: If previous history were an indicator, German forces of Army Group South had more than sufficient space in which to stop the Russian attacks. Just six months before, in the same general area around Kharkov, Army Group South had stopped an apparently similar Russian offensive by trading space for time in which to regroup. Mobile reserves were formed which defeated the Russians in small bites, attacking isolated groups and defeating them in detail. Space was not the limiting factor.

Time: Likewise, time was not a constraint to the Germans. There was no impending thaw or rainy season with which to contend. "General January or February" were behind them. Summer was the time of major German successes during the war years. Only in the larger sense that the Germans were being out-produced and out-mobilized was time on the Russian side.

Resources: Here the Germans were in serious trouble. The previous operations had drained the already meager German reserves. The flow of forces was now away from the Eastern Theater rather than toward it as the emphasis shifted to the West. German forces were spread too thin to hold all along the front and the Russian offensives were tying down too many forces to be able to form a mobile reserve of sufficient size to counter the penetrations. As the Russian attacks of massed armor cut through the relatively thin German lines, the shoulders would begin to form, but this time the Russians had learned their lesson. Subsequent attacks were directed against those shoulders to prevent their solidification. New attacks were launched in different sectors to use up the mobile reserves and prevent the Germans from creating mobile reserves. The Germans found themselves well beyond their culminating point with no new forces being introduced to help them. Indeed, the opposite was true; forces continued to be sent to the West.

Force ratios were as follows:

	German Fourth Panzer and Army Group Kempf	Voronezh and Steppe <u>Fronts</u>
Troops	300,000	980,000
Guns/Mortars	3,000	12,000
Tanks/SPs	600	2,400
Aircraft	900	1,275

The Voronezh Front alone had two tank armies as its operational mobile group. Four tank corps and a mechanized corps supported the armies. Further confounding the issue, the Soviets regrouped in much less time than the Germans thought possible. Therefore, the units were at a much higher level of combat power than the Germans expected.³⁷

In the final analysis of depth, space was in the Germans favor; time was not a factor in the short run, but resources were a serious handicap for the Germans. Overall, depth clearly favored the Russians. This disparity in depth so impacted on the German effort that even the operational genius of Manstein and the legendary agility of the German units could not overcome it.

Agility - Mobility: As was presented in Kharkov I, the Germans still had a marked edge in mobility.

C3I: German command and control also remained at least adequate to control a mobile defense of this type.

Mindset: The German mindset appeared to still be strongly in favor of maneuver warfare and well able to execute it. Many of the maneuvers attempted by the German units were similar to those successfully executed seven months earlier.

Agility remained a hallmark of the German forces, but it was never again to give them the operational victory or initiative over their deeper and fast-developing opponent.

Summary: Depth in favor of the Russians was not unusual to the German commanders in Russia. Fighting outnumbered was expected during almost every battle. Heretofore, the Germans had been able to locate an enemy weakness and create a situation in which they had the advantage. Those days were nearing an end as the Russian counteroffensive began. The Russian forces so outnumbered the Germans that they could attack at many places

virtually simultaneously. The Germans lost their freedom of maneuver and could not hold the shoulders of the penetrations or create a viable mobile reserve.

Conclusions: As seen in the Soviet counteroffensive at Kursk, greater relative agility can offset some lack of depth on the part of the defender. However, if the attacker has such an advantage in depth that the defender cannot hold the shoulders of the penetrations, the differential is too large to be overcome by superior agility alone. This is also the case when the attacker is able to put sufficient pressure throughout the sector to prevent the defender from withdrawing forces to form a viable mobile reserve.

Insufficient Depth and Sufficient Agility - Successful Ardennes (American Perspective)

General Situation: As the Allied forces swept across France, Hitler devised a plan which could only have come out of desperation. He decided to commit all his strategic reserves in one grand attempt to split the Allies by a thrust out of the Ardennes to the port of Antwerp (Map 8).³⁸ In his mind, this would cut off the entire British Army and cause a halt in the West, if not an Allied call for peace. Hitler felt his forces would then have time to race across Germany and stop the Russian winter offensive which was sure to come. Generals Rundstedt and Model strongly counseled against this plan as unworkable. Hitler, always suspicious of his generals, ignored their advice. A strategic reserve was formed at great effort and positioned for the offensive. That a reserve could be constituted at all was amazing, but Heinrich Himmler as the chief of the Replacement Army, and Reich Minister Joseph Goebbels as the head of production and manpower, were able to put together a credible force. By the time the attack was ready to go, Generalfeldmarschall Model, commanding Army Group B, had at his disposal four armies. Only three of the armies (5th Panzer Army commanded by General der Panzertuppen Hasso von Manteuffel, 6th Panzer Army commanded by Generaloberst der Waffen SS Sepp Dietrich, and the 7th Army commanded by General Brandenberger) took part in the offensive. These three assault

armies included seven panzer divisions, ten volksgrenadier (infantry) divisions, one parachute division, and Skorzeny's 150th Panzer Brigade which was using predominately captured American equipment.³⁹ Eleven of these divisions and Skorzeny's Brigade actually made it into the Bulge.

The Allies, too short on supplies and units to be able to be strong everywhere, had taken risk in the Ardennes sector of the front. It was here that new units were sent to be broken in and tired units were sent to rest. In the sector of the attack lay four divisions of Middleton's VIII Corps (the 106th Infantry, 28th Infantry, 9th Armor and the 4th Infantry) and one division (the 99th Infantry) of Gerow's V Corps.⁴⁰ As the attack began, Gerow was able to hold the Elsenborn Ridge against Dietrich's Sixth Panzer Army. This formed the very important northern shoulder (Map 9).⁴¹ In the south, Patton's Third Army, already anticipating the requirement to conduct a "left-flank", shifted north and provided the southern shoulder while sending other divisions on to the north to hit the German left flank. Within the reentrant, Middleton reacted in superb fashion by attempting to hold the critical road junctions of Saint Vith, Houffalize, and Bastogne. In order to buy time to do this, he fought tactical battles designed to slow the Germans sufficiently to allow reinforcements to arrive. This was successfully done as the 7th Armored Division shifted south over thirty miles, arriving at St. Vith on the evening of 17 December, and held the town against Dietrich's Sixth Panzer Army until the 23d. Also on the 17th, Eisenhower committed his SHAEF reserve, the XVIII Airborne Corps consisting of the 101st Airborne Division and the 82d Airborne Division. The 101st went directly to Bastogne where, by the 21st, it was encircled along with elements of the 9th and 10th Armored Divisions. On 20 December, Eisenhower also shifted the Army Group boundary to roughly split the Bulge, giving Montgomery responsibility for the north and Bradley responsibility for the south. This decision also facilitated the subsequent counteroffensive to reduce the Bulge and drive on into Germany.

The holding of Bastogne, St. Vith, and the two shoulders threw the German advance completely off schedule, preventing it from reaching even its first objectives (short of the Meuse

River), and buying sufficient time for the weather to clear allowing the U.S. Air Force to cripple the German advance.

Depth - Space: Space was a serious limitation for the American forces in this sector. In terms of divisional frontages, the paucity of forces stretched them to the limit and precluded a viable tactical reserve in sector. In terms of distance to the rear, it was too short. The Meuse River, a major obstacle and key terrain, was only 30-40 miles to their rear with few if any reserves between the front line units and the river. Broad fronts, coupled with a relatively shallow sector and limited reserves, created an opportunity for the Germans to make a successful breakthrough. Once across the Meuse River it would have been a race to Antwerp, with relatively few Allies in the running.

Time: The Germans timed their attack to take advantage of the bad flying weather to negate the Allied advantage in the air. The Germans were also able to commit forces much more quickly initially than the Allies because they were marshalled in the area immediately behind the lines. Therefore, as long as the weather remained bad, time was on their side, at least until the Allies were able to react with large forces. The Germans anticipated that the Allies would suffer significant delays due to friction in committing major forces. In this regard they were disappointed.⁴²

Resources: As noted earlier, the Germans had seventeen divisions in the sector of the attack. Of these seventeen divisions, eleven were actually able to break through into the Bulge. Opposing these forces initially were only five divisions in sector with no reserve between them and the Meuse River (Map 10).⁴³

Agility - Mobility: It was here that a significant advantage existed for the Americans. As discussed in the Normandy section, the American divisions were significantly more mobile than their German equivalent. This allowed American commanders to move entire divisions over extended distances and immediately commit them to the battle as they arrived because their combat support and combat service support came along with them. The Seventh Armored Division, in particular, and all the divisions of Patton's Third Army are excellent examples of this

capability.

C3I: The Allied command and control network was clearly adequate to overcome the challenge. This does not mean that every unit was constantly in communications with its superior and subordinates, but they were able to do the right thing at the right time. In the case of intelligence, the amount of surprise achieved by the Germans was significant, but not absolute, as was demonstrated by Patton's Third Army Staff already at work on a movement plan before the German attack began. The C3I network functioned well enough to allow the Allies to respond sufficiently rapidly to reinforce a grossly understrength sector before it could be fully breached and to bring forces to bear which threatened the Germans operationally, thus regaining the initiative for the Allies.

Mindset: The names of Patton, Collins and, perhaps to a lesser degree, Bradley and Middleton, establish a reference for what the mindset was among the American forces. Clearly it was a mindset of mobility and flexibility. Even though many units had been sitting in defensive positions for some time before the attack, they were, by and large, the same units which had fought their way across France in the greatest feat of mobile warfare ever seen. Their actions clearly demonstrate that they had not forgotten how to conduct mobile warfare effectively.

Summary: The Germans were able to mass overwhelming combat power against relatively weak and untried American forces, achieving significant initial successes. The actions on the part of the units holding the shoulders, as well as the units moved in from out of sector to occupy key road junctions such as St. Vith and Bastogne, resulted in the German timetable being delayed to the point of failure. The agility demonstrated by American units was clearly superior to the Germans and was sufficient to overcome the initial disadvantage of relative depth. The determining factor as to whether there was sufficient depth to allow the Americans to capitalize on the advantage of agility appeared to be the ability to hold the shoulders and to constitute a viable operational mobile reserve with which to conduct the counterattacks.

Conclusions: As the Battle of the Bulge example shows, agility can overcome a lack of depth if there is sufficient depth to at

least hold the shoulders of the penetration and to allow for the formation of a viable operational mobile reserve.

III. Conclusions:

There is a definite relationship between depth and agility which centers on relative time. Picture a force which is so dense as to be the veritable "brick wall," or so overwhelming as to be able to accept a blow, and engulf it like quicksand. This was well illustrated by the defensive efforts of the Russian forces at Kursk. It is, therefore, evident that a force which has overwhelming depth requires much less agility than a force that is deficient in depth.

The greater the depth the more time available to respond, but, even in cases of superior relative depth, a certain minimum level of agility is required to capitalize on that advantage, or it will ultimately be lost. An example of this phenomenon is the German defenses during the early stages of the Normandy landings. Because of the poor command and control arrangements by the Germans and the counter-mobility campaign by the Allied Air Forces, the German operational mobile reserves were not committed against the beachhead in a timely manner. Once the beachhead was consolidated, German combat power was no longer sufficient to be decisive. This was again seen even more dramatically in Manchuria where the sole advantage of the Japanese was a vast expanse of space and defensible terrain. Even that was not translated into time due to a lack of a minimum level of agility.

It therefore follows that a force which is lacking in relative depth must be more agile in order to respond successfully to potentially decisive breakthroughs as the Americans did in the Ardennes. Even though penetrated within a shallow sector by a vastly superior force, American forces were able to hold the shoulders and employ viable operational mobile reserves to thwart the penetration before it reached the potentially decisive terrain of the Meuse River.

It is also true that as depth decreases, a point is reached at which the force is so lacking in depth that it can neither hold the shoulders of a penetration nor form a viable operational reserve. At this point it cannot succeed regardless of its relative agility. Thus was the case of the Germans during the Russian counteroffensive following Kursk. Even their far greater relative agility was insufficient to be

successful. The extreme of this condition approaches the physical impossibility of a more agile force being required to be everywhere at once because no place is unthreatened.

The lessons for NATO are clear. If more depth could be obtained that would be desirable. While it is possible to increase depth incrementally by increasing time through improved earlier warning, pre-dug obstacles, FOFA and other high-technology options, it may be too expensive to do so. Many of these options are extremely expensive in terms of both funding and political repercussions. So, although more depth is clearly desirable, it may not be feasible to achieve it.

Time, however, is still critical; time to respond by deploying forces into the theater, repositioning available forces to threaten enemy weaknesses, and time to conduct more extensive preparation of the battlefield. Since NATO's efforts to increase depth cannot be fully successful when compared to the threat, the Alliance should concentrate efforts on increasing our agility to compensate for this lack of depth.

Greater relative gains in agility can be expected far more cheaply than commensurate gains in depth for many reasons:

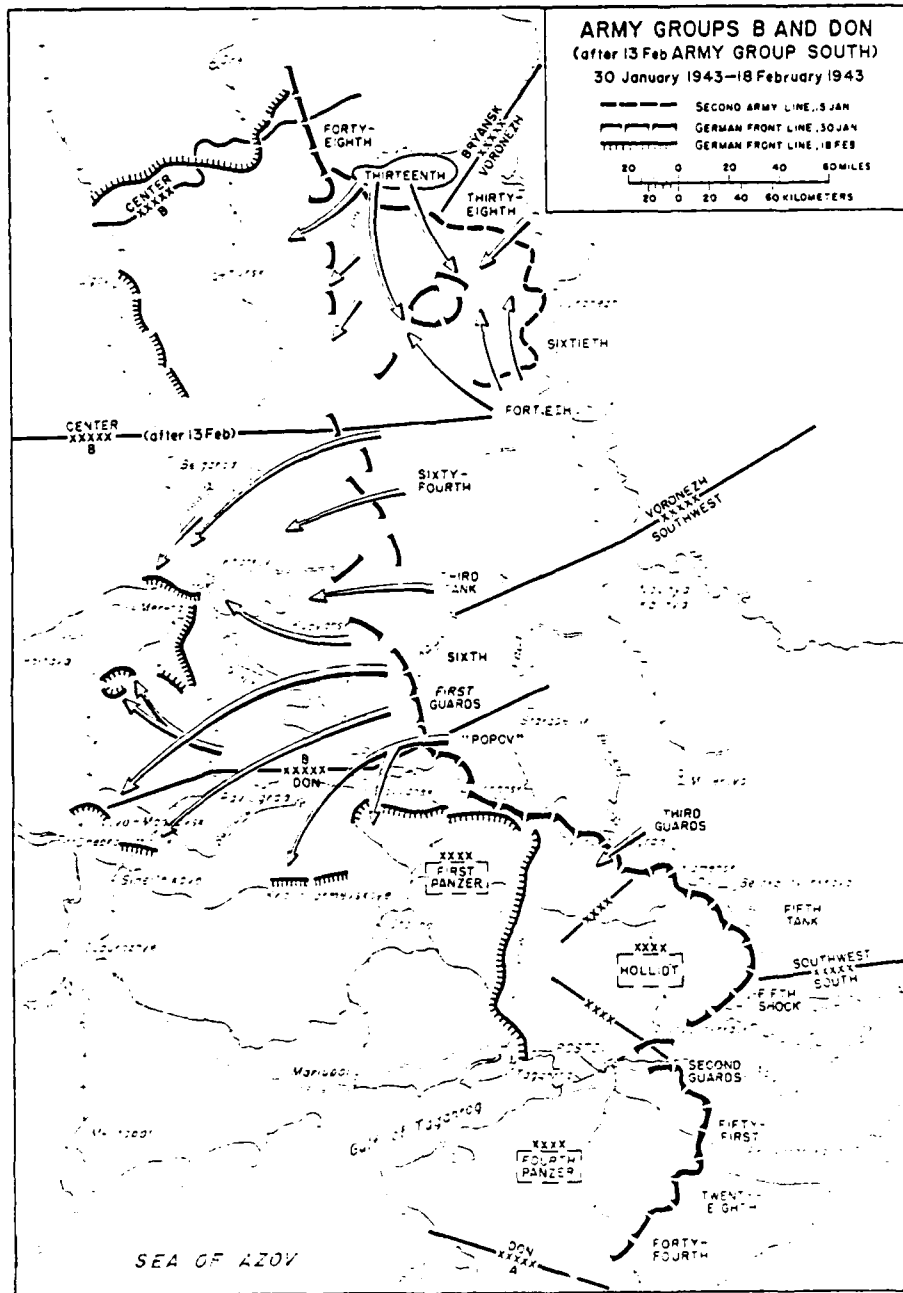
1. Agility is largely a mindset, as is evident in the historical examples cited and by definition in FM 100-5. Training and war games alone should provide a significant improvement in agility.

2. Gains in depth have been the priority for several years and the easy and inexpensive discoveries have probably already been made.

3. Agility has had little recent emphasis and, therefore, could provide some feasible alternatives very rapidly.

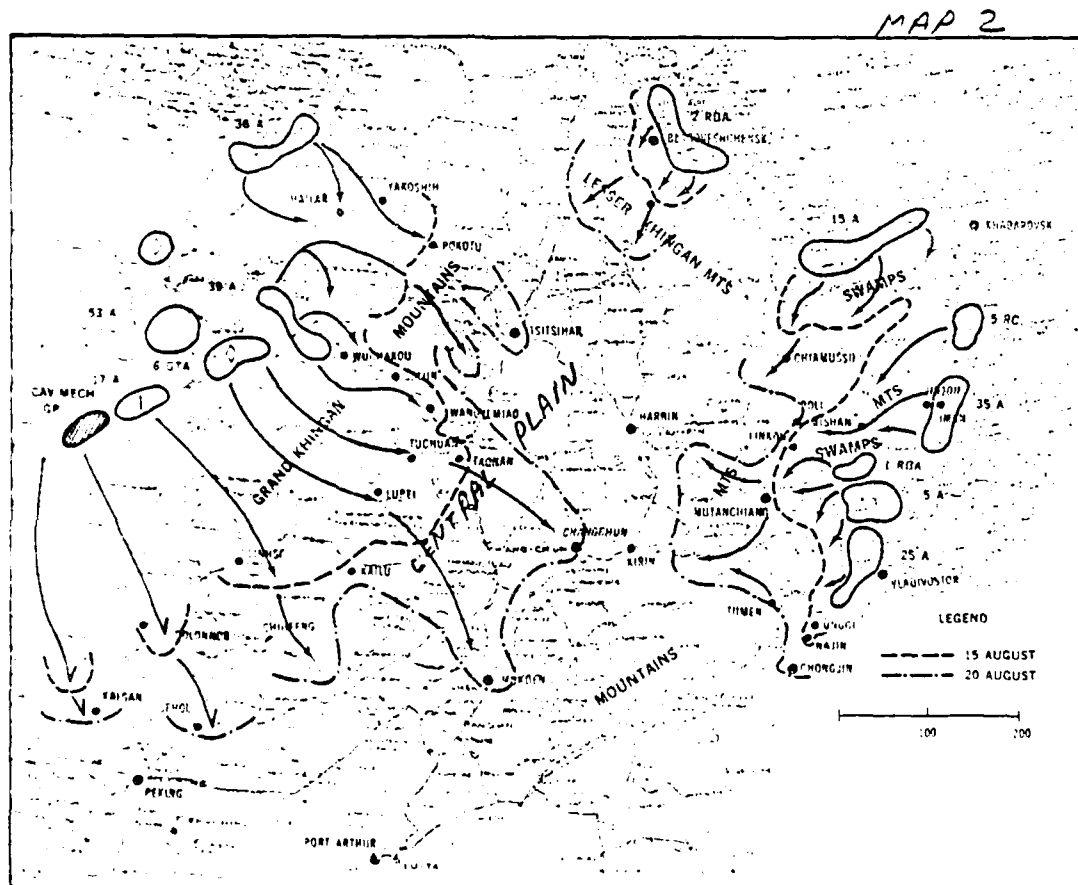
The strength of the Warsaw Pact is in its depth. Although the lack of flexibility in their organizations has probably been overstated by some authorities, their centralized control system is inherently less agile than that of the forces in NATO. NATO should therefore emphasize its potential advantage in relative agility to defeat any aggression by the Warsaw Pact.

MAP 1: KHARKOV I



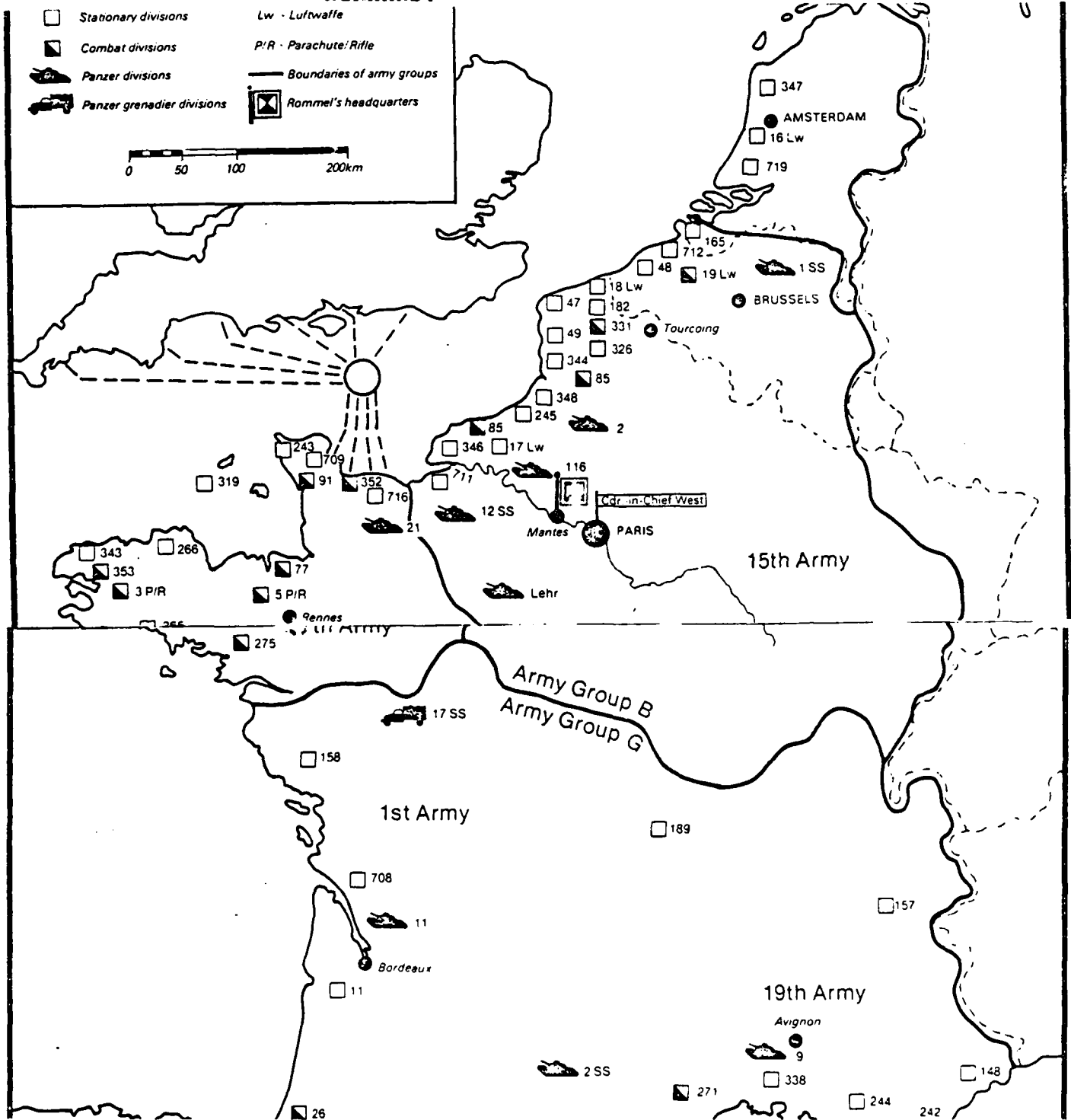
MAP 1: KHARKOV I (Reproduced
from Stalingrad To Berlin by
Earl F. Ziemke)²

MAP 2: MANCHURIA



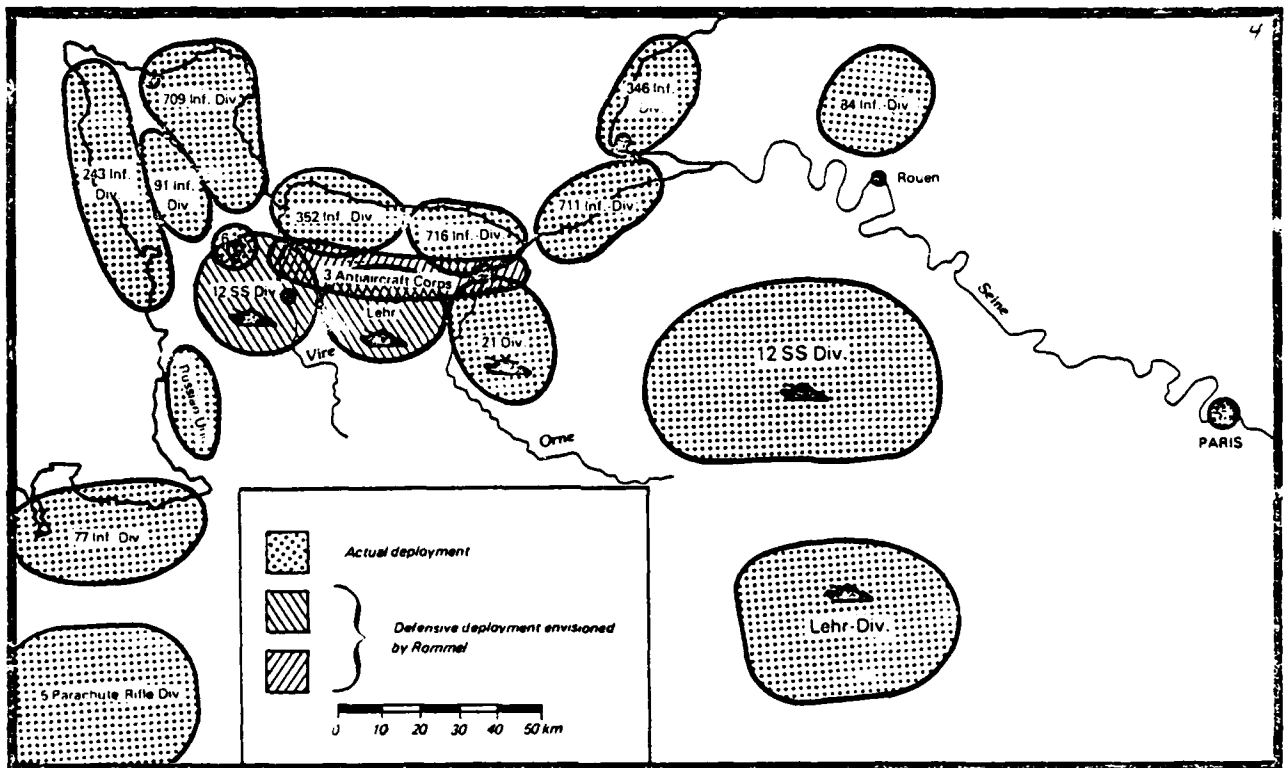
MAP 2: MANCHURIA (Reproduced from August Storm: The 1945 Soviet Offensive in Manchuria, by LTC David M. Glantz)¹³

MAP 3: GERMAN DISPOSITIONS AT NORMANDY



MAP 3: GERMAN DISPOSITIONS AT
NORMANDY (Reproduced from
Rommel in Normandy, by
Friedrich Ruge)¹²

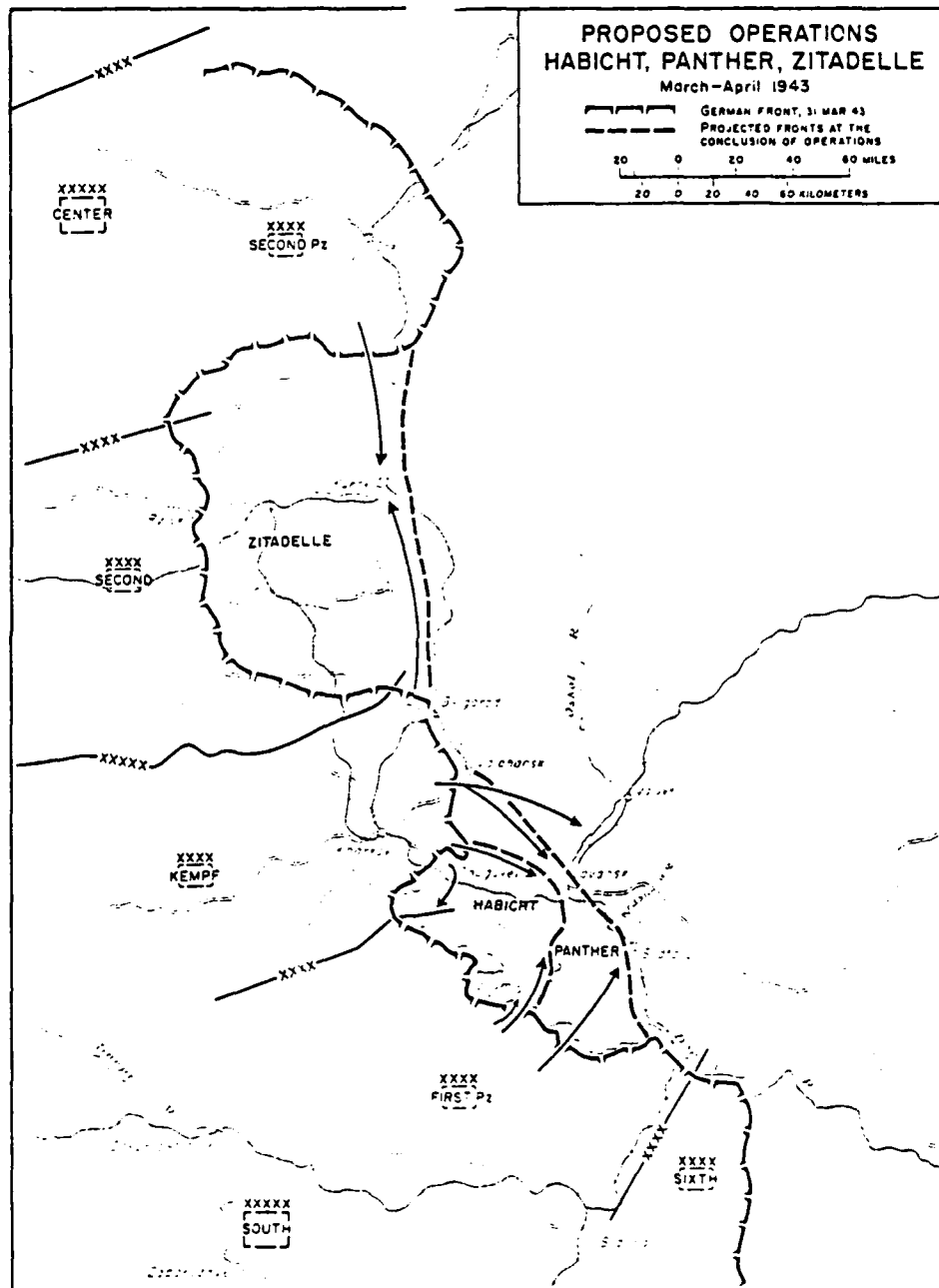
MAP 4: GERMAN DISPOSITIONS IN
NORMANDY ON D-DAY



German deployment in Normandy on the day of the Invasion

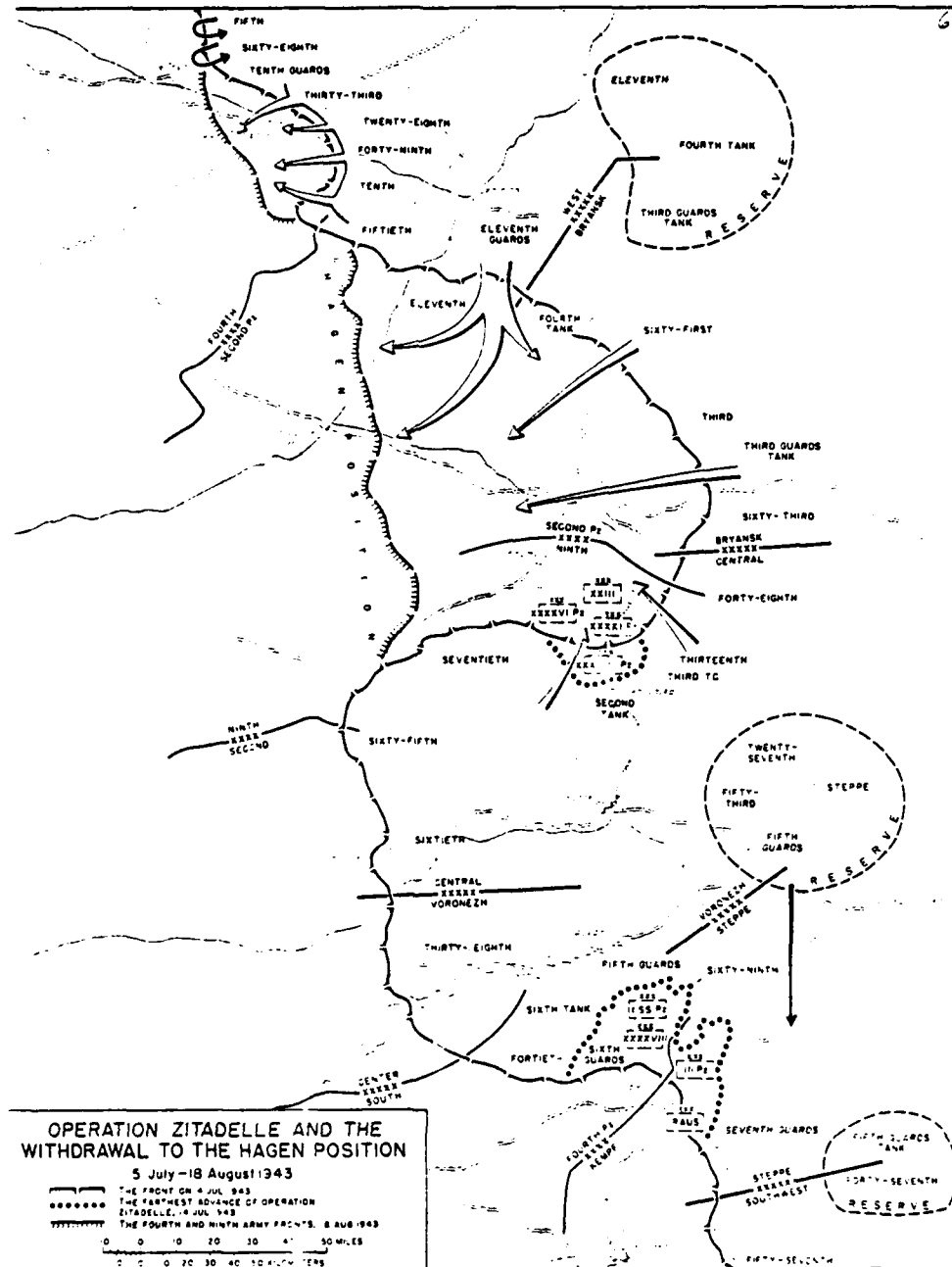
MAP 4: GERMAN DISPOSITIONS IN
NORMANDY ON D-DAY (Reproduced
from Rommel in Normandy, by
Friedrich Ruge)²²

**MAP 5: KURSK I, THE GERMAN
OFFENSIVE**



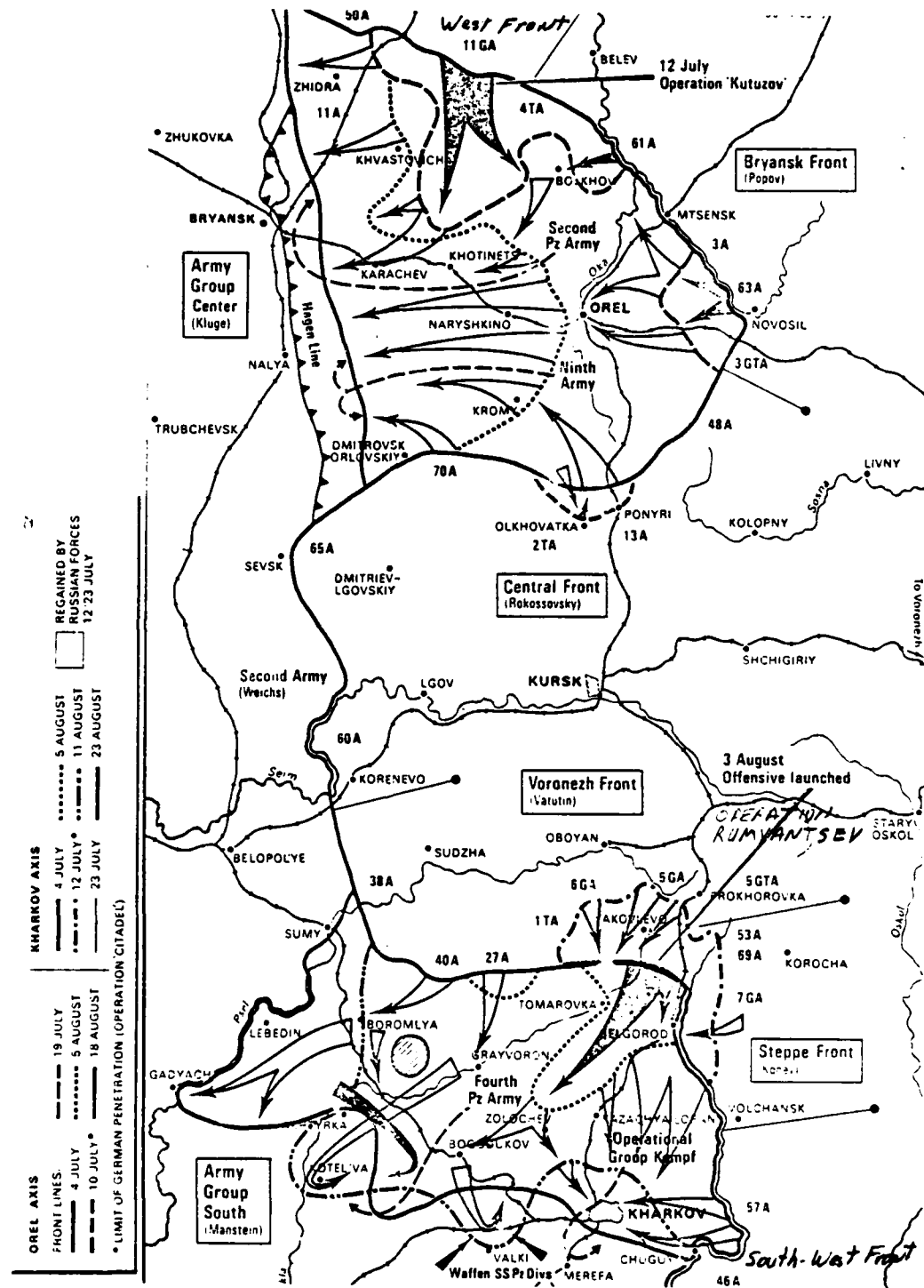
**MAP 5: KURSK I, THE GERMAN
OFFENSIVE (Reproduced
from Stalingrad To Berlin by
Earl F. Ziemke) 26**

MAP 6: KURSK II, DISPOSITION OF SOVIET FORCES



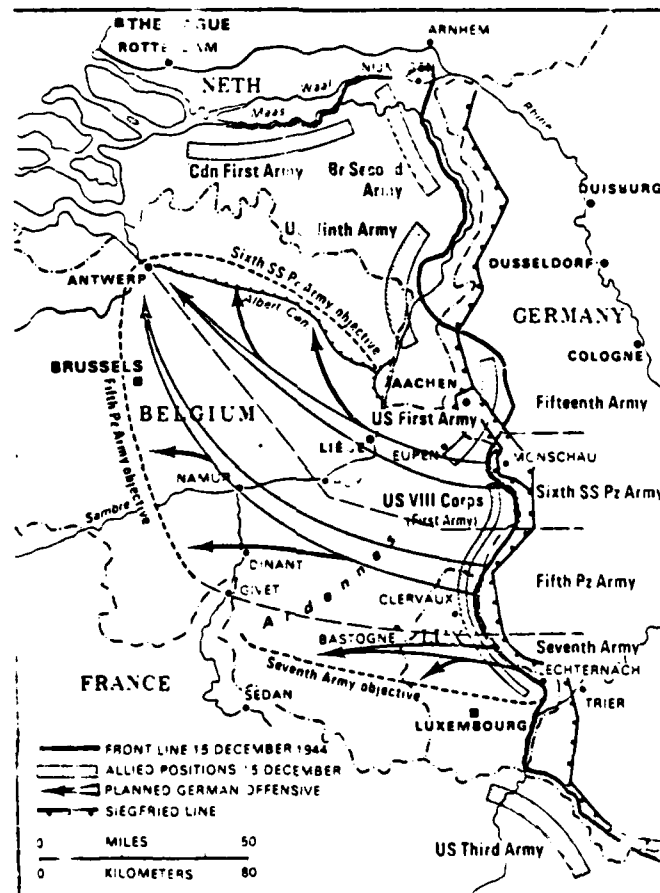
MAP 6: KURSK II, DISPOSITION OF SOVIET FORCES (Reproduced from Stalingrad To Berlin by Earl F. Ziemke)²²

MAP 7: KURSK II, THE SOVIET COUNTEROFFENSIVE



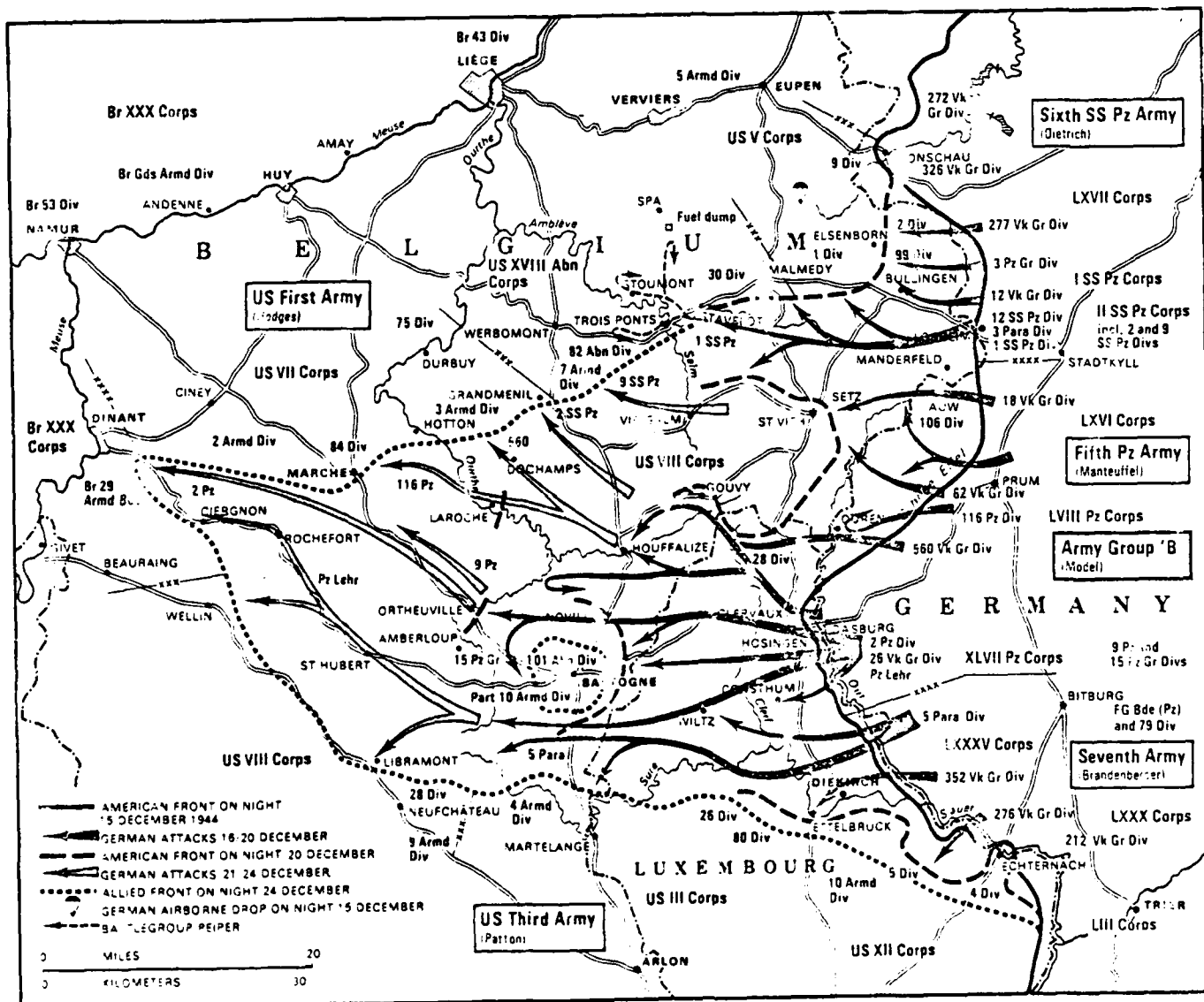
MAP 7: KURSK II, THE SOVIET COUNTEROFFENSIVE (Reproduced from Atlas of World War II, by Richard Natkiel)

MAP 8: THE GERMAN PLAN IN THE ARDENNES



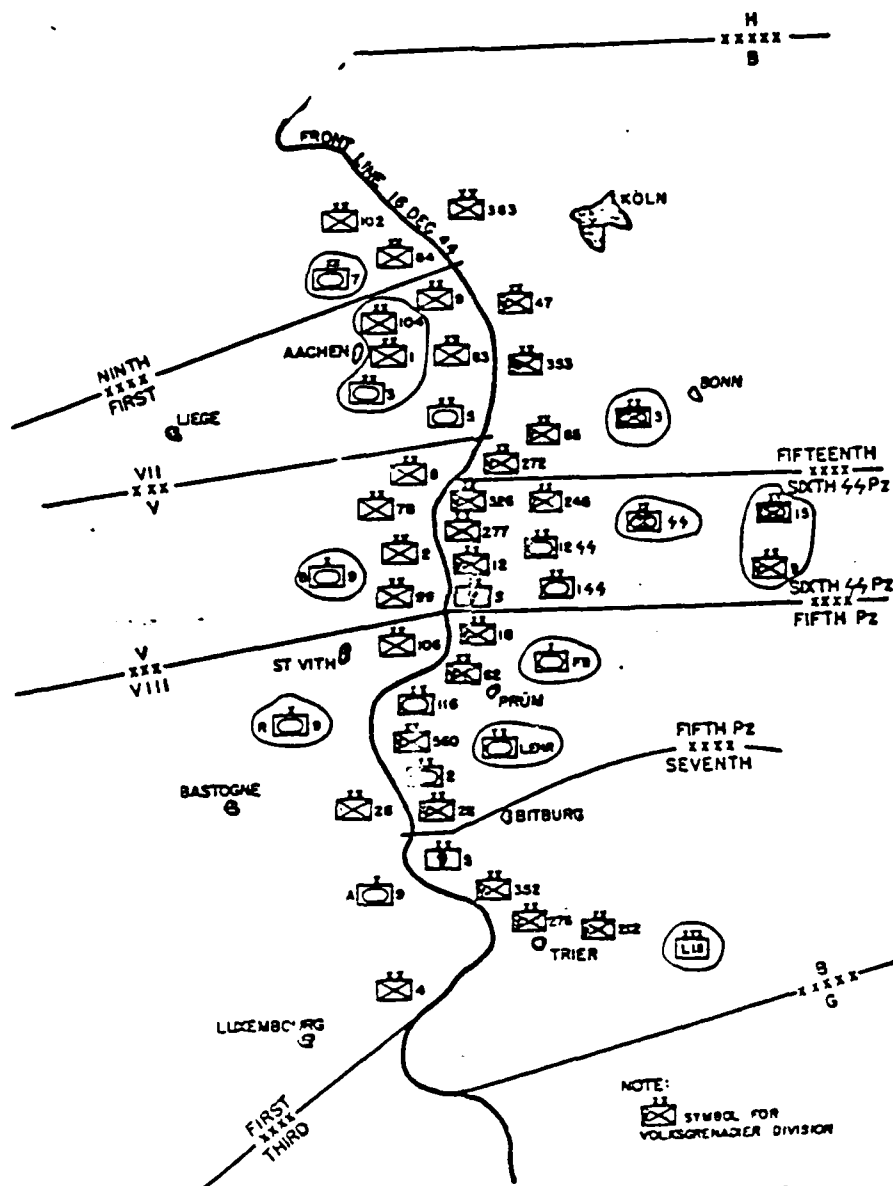
MAP 8: THE GERMAN PLAN IN THE ARDENNES (Reproduced from Atlas of World War II, by Richard Natkiel)²⁷

MAP 9: THE BATTLE OF THE ARDENNES



MAP 9: THE BATTLE OF THE ARDENNES (Reproduced from Atlas of World War II, by Richard Natkiel)

MAP 10: TROOP DISPOSITIONS, 16
DECEMBER 1944



MAP 10: TROOP DISPOSITIONS, 16
DECEMBER 1944 (Reproduced from
The Lucky Seventh in the Bulge,
by Gregory Fontenot) 43

ENDNOTES

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- ²⁶ Weigley, p.30.
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- ²⁸ Glantz, p.14.
- ²⁹ Epstein, pp.5-6.
- ³⁰ Glantz, p.14.
- ³¹ Ziemke, p.134.
- ³² Ibid. pp.133-135.
- ³³ Epstein, p.6.
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- ³⁵ Natkiel, p.154.
- ³⁶ Ziemke, p.150.
- ³⁷ Epstein, p.9.
- ³⁸ Natkiel, p.183.
- ³⁹ Fontenot, Gregory, The Lucky Seventh in the Bulge: A Case Study for the AirLand Battle, (CGSC, Fort Leavenworth, Kansas, 1985), pp. 18-19.
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42 Stokesbury, p.354.

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